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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/902,774	07/10/2001	Katsutoshi Takeda	4970/01592	1362

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EXAMINER

MUTSCHLER, BRIAN L

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 05/30/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/902,774

Applicant(s)

TAKEDA ET AL.

Examiner

Brian L. Mutschler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Comments

1. The rejection of claims 1-7 under 35 U.S.C. 103 under Younan et al. have been overcome by Applicant's amendment. Claim 1 has been amended to recite the limitation, "connecting positive and negative output lines of each solar cell module to positive and negative cables". While Younan et al. disclose terminal pair connectors 52 for connecting the modules, but do not explicitly disclose how the solar cell modules are connected to collect the output, e.g., by connecting to positive and negative cables. Claims 6 and 7 were amended to recite the limitation wherein the wiring member is sealed in a resin. Younan et al. disclose the use of electrically insulated wires, but do not disclose how the wires are insulated.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 19, 2003, has been entered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

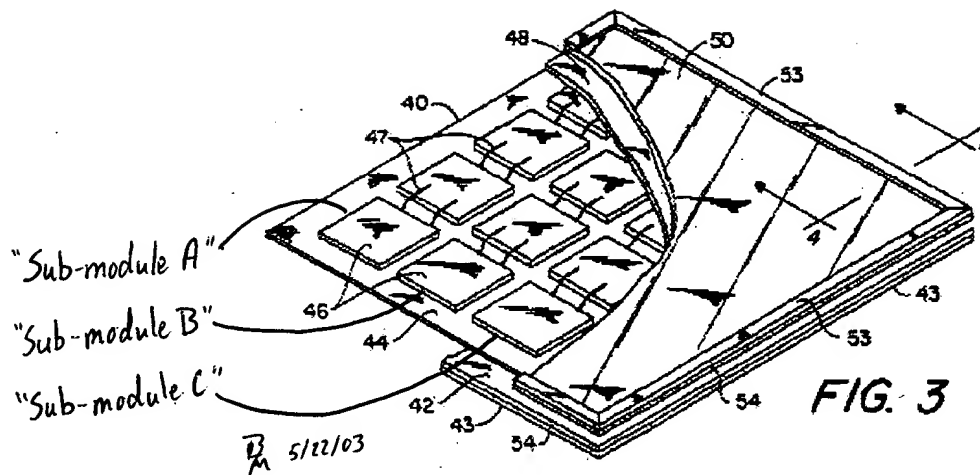
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Hanoka (U.S. Pat. No. 5,733,382).

Hanoka discloses a solar cell module **40** comprising a supporting member, glass support sheet **50**; a plurality of solar cells **46** connected in series and parallel; a wiring member **47** for connecting the solar cells **46** to one another; a moisture impermeable cover member, glass sheet **42**, mounted on the support member **50** and covering wiring members **47**; and resin sheets **44** and **48** sealing the wiring member between the supporting member **50** and the cover member **42** (fig. 3; col. 5, lines 27-64).

Although Hanoka does not use the term "sub-module" to define the organization within the module, as can be seen in the annotated reproduction of Figure 3 below, one skilled in the art would have recognized that each group of solar cells **46** connected in series would be considered a sub-module.



Since Hanoka teaches all of the structural limitations recited in the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Younan et al. (U.S. Pat. No. 5,575,861) in view of Tennant (U.S. Pat. No. 4,321,416) and in view of JP 11-195803, herein referred to as JP '803.

Younan et al. disclose a method for installing a photovoltaic system for utilizing the maximum area in the installed location through the use of different sized solar cell modules (figs. 2 and 4A-4C; col. 6, line 60 to col. 7, line 10). In Figure 2, Younan et al. show a module having seven tabs **32**, each containing a sub-module, or photovoltaic

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device **36** (col. 5, line 42). In Figure 4A, Younan et al. show a module having three tabs **32** each containing a photovoltaic device **36**. Younan et al. also disclose, "the devices **36** may be interconnected in a series configuration, a parallel configuration or a mixed series-parallel configuration" and "by appropriately configuring the interconnections, current and voltage of the resultant combination may be controlled" (col. 5, lines 58-62). As shown in Figures 4A-4C, the modules can be made in various shapes and sizes, and "through the use of the variously configured members...differing areas and shapes of roofs may be effectively covered" (col. 7, lines 7-10). The modules further comprise terminal pairs **52** for connecting the output of each module to a load or power storage system (col. 7, lines 41-49).

Regarding claim 2, the solar cell modules comprise shown in Figures 2 and 4A have a different number of sub-modules of an equal size.

Regarding claims 3-5, Younan et al. teach, "the devices **36** may be interconnected in a series configuration, a parallel configuration or a mixed series-parallel configuration" and "by appropriately configuring the interconnections, current and voltage of the resultant combination may be controlled" (col. 5, lines 58-62).

The method of Younan et al. differs from the instant invention because Younan et al. do not disclose the following:

- a. The modules have an equal output voltage, as recited in claim 1.
- b. Connecting positive and negative output lines of each solar cell module to positive and negative cables, as recited in claim 1.

- c. The sub-modules in the modules comprise a plurality of power generating regions, and the power generating regions are connected in series or parallel so that the plurality of solar cell modules obtain an equal output voltage, as recited in claim 5.

Regarding claim 1, Tennant disclose a method for connecting solar cell modules on a roof, wherein each module has terminal leads **34, 36** connected to positive and negative output cables (bus connectors) **50, 52** in a parallel manner using conductors **60** (figs. 3 and 5; col. 3, line 49 to col. 4, line 64). The use of positive and negative output cables allows the power generated by the solar cell modules to be collected and used to power a load.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Younan et al. to connect the output terminals to positive and negative cables as taught by Tennant because connecting the terminals to cables allows the power generated by the solar cell modules to be collected and used to power a load.

Regarding claims 1 and 5, JP '803 teaches a method for installing solar cell modules comprising different sized modules containing different numbers of similarly sized solar cells connected in series and parallel (see English abstract). JP '803 also teaches that voltage mismatch results in a loss of output (see paragraph [0045]). JP '803 discloses the use of three modules of different sizes comprising similarly sized solar cells: the small module comprises 6 solar cells in a 1.5m x 0.2m module; the

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medium module comprises 8 solar cells in a 2.0m x 0.2m module; and the large module comprises 16 solar cells in a 4.0m x 0.2m module.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the output of the modules of Younan et al. to have an equal voltage output because JP '803 teaches that mismatches in voltage in connected units results in a loss of output.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the modules of Younan et al. to use a plurality of power generating regions in each sub-module as taught by JP '803 because using more power generating regions generates more power.

The use of the term sub-module does not limit the claim because it does not further limit the structure of the module. The term sub-module merely defines a level of organization, e.g., power generating regions → solar cell sub-modules → solar cell modules. The sub-modules can be any ordered arrangement of power generating regions within the module. For example, in JP '803, the sub-module could be defined as a group of 2 solar cells. Using that definition, the small module comprises 3 sub-modules, the medium module comprises 4 sub-modules and the large module comprises 8 sub-modules.

7. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dillard (U.S. Pat. No. 5,928,437) in view of Tennant (U.S. Pat. No. 4,321,416).

Dillard discloses a method for installing a plurality of solar cell modules, wherein the modules are different sizes and have matched voltage outputs. In one example, one module, referred to as an array by Dillard, comprises 72 solar cells having dimensions of 2cm x 2cm and a second module comprises 72 solar cells having dimensions of 0.25cm x 0.25cm; both modules have an output of 36 volts (col. 1, line 52 to col. 2, line 57). The modules are connected to one another in parallel (col. 8, lines 33-36).

Regarding claim 2, the modules provided in the example discussed above provide are made of 72 sub-modules and 1 sub-module, respectively, wherein the sub-module is defined as a 2cm x 2cm area.

Regarding claims 3-5, the modules have rear and front interconnects **100** and **106** for providing series and parallel electrical connections between the individual solar cells (col. 4, lines 38-40).

The method of Dillard differs from the instant invention because Dillard does not disclose connecting the positive and negative output lines of each module to positive and negative cables, as recited in claim 1.

Regarding claim 1, Tennant disclose a method for connecting solar cell modules on a roof, wherein each module has terminal leads **34, 36** connected to positive and negative output cables (bus connectors) **50, 52** in a parallel manner using conductors **60** (figs. 3 and 5; col. 3, line 49 to col. 4, line 64). The use of positive and negative output cables allows the power generated by the solar cell modules to be collected and used to power a load.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Dillard to connect the output of the modules to positive and negative cables as taught by Tennant because connecting the output of the modules to cables allows the power generated by the solar cell modules to be collected and used to power a load.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admissions of prior art made in the instant specification in view of JP 10-082152, herein referred to as JP '152.

The instant specification describes a known solar cell module comprising a metal base **111**; two solar cell sub-modules **112** mounted on the base **111**; a raised portion **122** having a first engagement section **121** at its end; a suspended portion **124** having a second engagement section **123** that comes into engagement with the first engagement section **121**; a base section **125** on the raised portion **122** parallel to the base **111**; and wiring members sealed in a resin layer (see page 3, line 5 to page 5, line 1 and Figure 3).

The prior art module disclosed in the instant specification differs from the instant invention because the connection is not made between the base section and the base of the raised portion.

JP '152 discloses a solar cell module comprising a base, a suspended portion and a raised portion, wherein the raised portion has a section parallel to the base (figs. 1 and 2). The electrical connection is made between the section of the raised portion

parallel to the base and the base, wherein "rain infiltration is more surely prevented" (see English abstract and Figure 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the connection in the prior art module disclosed in the instant invention to be between the parallel section of the raised portion and the base as taught by JP '152 because positioning the connection underneath the raised portion helps prevent the infiltration of rain.

Response to Arguments

9. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

10. The rejections applied in the prior Office action were overcome by Applicant's amendment to the claims, necessitating the new grounds of rejection presented above.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. No. 6,525,262 and U.S. Pat. No. 6,128,868 are the U.S. equivalents to JP 11-195803 and JP 10-082152, respectively.

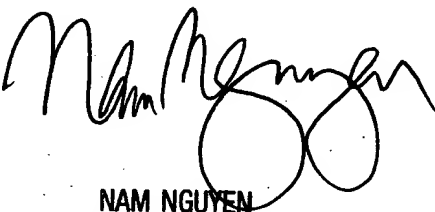
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

blm
May 22, 2003



NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700